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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/570,125	10/23/2006	Albert J. Banes	4647-060533	7408

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EXAMINER	
GIBBS, TERRA C	

ART UNIT	PAPER NUMBER
1635	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/570,125	BANES ET AL.	
	Examiner	Art Unit	
	TERRA C. GIBBS	1635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *8-12 and 15-18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,13 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *July 19, 2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is a response to Applicant's Election filed November 21, 2008.

Claims 1-18 are pending in the instant application.

Election/Restrictions

Applicant's election with traverse of Group IV, drawn to a method for manipulating the intrinsic strain of cells, comprising treating the cells with compounds that affect the intrinsic strain setpoint of the cells in order to modulate extracellular matrix synthesis, secretion, stiffness, organization and/or remodeling, or attachment of the cells to the matrix via integrins or other like cell-matrix attachments, wherein the compound is a cytokine which adjusts the intrinsic strain of cells by modulating gene expression in the reply filed on November 21, 2008 is acknowledged. Applicant's further election of the species of interleukin-1 beta (IL-1β) from claim 14 is also acknowledged. The traversal is on the ground(s) that a search and examination of Groups I-VII may be made without imposing a serious burden on the Examiner. Applicants contend that conducting a search on the subject matter of Groups I-VII would not unduly burden the Examiner because the subject matter of these Groups is relatively similar and a search in one Group would necessarily include a search of the second. Applicants also contend that a search in one Group would lead to references relevant to the remaining Groups because each Group is drawn to a similar method.

This traversal has been fully considered, but is not found persuasive because contrary to Applicants contentions, conducting a search on the subject matter of Groups

I-VII would indeed be unduly burden the Examiner because the subject matter of these Groups is not relatively similar and a search in one Group would not necessarily include a search of the second. This is primarily due to the fact that Groups I-VII do not relate to a single general inventive concept under PCT Rule 13.1 because they lack the same or corresponding special technical feature. In this regard, references relevant to a search in one Group would not necessarily lead to references relevant to the remaining Groups because each Group is drawn to different methods, which lack the same or corresponding special technical feature, each from the other. Therefore, restriction for search and examination purposes is proper.

Accordingly, claims 8-12 and 15-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on November 21, 2008.

Claims 1-7, 13, and 14 have been examined on the merits.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

The drawings filed on February 28, 2006 are acknowledged and have been accepted by the Examiner.

Nucleotide Sequence Disclosures

This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 C.F.R. §1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 C.F.R. §1.821-1.825 for the reason(s) set forth below; The disclosure contains sequences which fall under the purview of 37 CFR 1.821 through 1.825 as requiring SEQ ID NOs., but which are not so identified. For example, see Table 1. Applicant must fully comply with the sequence rules for any response to this action to be considered fully responsive.

Information Disclosure Statement

Applicant's information disclosure statement filed July 19, 2007 is acknowledged. The submission is in compliance with the provisions of 37 CFR §1.97. Accordingly, the Examiner has considered the information disclosure statement, and a signed copy is enclosed herewith.

Priority

Receipt is acknowledged of foreign priority papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4, 7, and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 4 and 7 are indefinite because the trademarks BAT™ and Arctangle™ are used, respectively. If the trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of the 35 U.S.C. 112, second paragraph. *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. In fact, the value of a trademark would be lost to the extent that it became descriptive of a product, rather than used as an identification of a source or origin of a product. Thus, the use of a trademark or trade name in a claim to identify or describe a material or product would not only render a claim indefinite, but would also constitute an improper use of the trademark or trade name. Correction is required.

Claim 14 is indefinite because tumor necrosis factor-alpha has been incorrectly abbreviated as TGF-α instead of TNF-α. Correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 13, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Hartwig et al. (J Interferon Cytokine Res., 2001 Oct; 21(10):851-860).

Claim 1 is drawn to a method for manipulating the intrinsic strain of cells, comprising treating the cells with compounds that affect the intrinsic strain setpoint of the cells in order to modulate extracellular matrix synthesis, secretion, stiffness, organization and/or remodeling, or attachment of the cells to the matrix via integrins or other like cell-matrix attachments. Claims 13 and 14 are dependent on claim 1 and include all the limitations of claim 1 with the further limitations wherein the compound is a cytokine which adjusts the intrinsic strain of cells by modulating gene expression; and wherein the cytokine is interleukin-1 beta (IL-1β). It is noted that the instant specification discloses, at paragraph [0046]:

> "In still another embodiment of the present invention, RNA silencing techniques or other gene expression modulating techniques can be used to reduce expression of genes which affect the intrinsic strain setpoint of an *in situ* native tissue or an *in vitro* tissue engineered construct"

Hartwig et al. disclose the modulation of the cytokine interleukin-1 beta (IL-1β) using antisense oligonucleotides in human stromal cells *in vitro* (see Abstract, for example).

While Hartwig et al. is silent with respect to intrinsic cell strain, the method steps carried out are the same as those recited in the claimed invention (treating of cells with a compound that affects intrinsic cell strain). Because the method steps are the same, Hartwig et al. is inherently teaching the same method of manipulating intrinsic strain of cells as the current application, absent evidence to the contrary.

Therefore, Hartwig et al. anticipate claims 1, 13, and 14, absent evidence to the contrary.

Claims 1, 6, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,472,202, B1 (Banes et al.), presented and made of record on Applicant's Information Disclosure Statement filed July 19, 2007.

Claim 1 is as described above. Claims 6 and 7 are dependent on claim 1 and include all the limitations of claim 1 with the further limitations of further comprising applying a mechanical external strain to the cells; and wherein the mechanical external strain is comprised of uniaxially loading a tissue engineered construct by placing Arctangle™ loading posts beneath a well of a culture plate and applying a vacuum to deform a flexible membrane downward so as to apply a uniaxial strain along a long axis of the tissue engineered construct.

Banes et al. disclose a loading station assembly and a method for tissue engineering that allows equibiaxial, uniaxial or other directional stretching of a flexible cell culture membrane (column 2, line 26)(claim 7). Since the method involves seeding of cells with adherence to polyester foam, the method is interpreted to include treating

the cells with a compound that affects intrinsic strain setpoint by causing engagement of cell attachment points of the cells from its extracellular matrix (column 7, line 42) (claims 1 and 11). The use of a circular loading post (column 2, line 51) for application of the mechanical external strain with application of a vacuum is also taught (Abstract) (claim 8).

Therefore, Banes et al. anticipate claims 1, 6, and 7.

Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,912,234 A (Ruoslahti et al.), presented and made of record on Applicant's Information Disclosure Statement filed July 19, 2007.

Claim 1 is as described above. Claims 2-5 are dependent on claim 1 and include all the limitations of claim 1 with the further limitations wherein the cells comprise an *in situ* native tissue; wherein the cells comprise an *in vitro* fabricated tissue engineered construct; wherein the tissue engineered construct is a human tendon internal fibroblast (HTIF)-populated bioartificial tendon (BAT™) or other fibroblast from another connective tissue; and wherein the compound is added at the beginning, during or at the end of fabrication of the tissue engineered construct. It is noted that the instant specification discloses, at the Abstract that the compounds can be a peptide that disrupts integrin binding to matrix components.

Ruoslahti et al. discloses the use of peptides that bind to integrins and block the ability of the integrins to bind to extracellular matrix proteins. At the bottom of column 6 through the top of column 7, Ruoslahti et al. clearly contemplates treatment of *in situ*

tissues for the prevention of metastasis or for enhancing wound healing in concert with a prosthetic device or being integrated into a matrix to be implanted. In the case of wound healing contemplation, the compound is clearly added at the beginning of the fabrication, as the fabrication would seem to occur *in situ*.

While Ruoslahti et al. is silent with respect to intrinsic cell strain, the method steps carried out are the same as those recited in the claimed invention (treating of cells with a compound that affects intrinsic cell strain). Because the method steps are the same, Ruoslahti et al. is inherently teaching the same method of manipulating intrinsic strain of cells as the current application, absent evidence to the contrary.

Therefore, Ruoslahti et al. anticipate claims 1-5, absent evidence to the contrary.

Conclusion

No claims are allowable.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terra C. Gibbs whose telephone number is 571-272-0758. The examiner can normally be reached from 9 am - 5 pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James "Doug" Schultz can be reached on 571-272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

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For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

February 11, 2009
/Terra Cotta Gibbs/